

# The Strong U.S. Dollar: A Dilemma for Foreign Monetary Authorities

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**B**OLSTERED by higher short-term market interest rates and a lower rate of inflation than those abroad, the U.S. dollar has been quite strong in foreign exchange markets since the middle of 1980. Its trade-weighted value has risen 35 percent from July 1980 to April 1982.<sup>1</sup> The general strength of the dollar has elicited sharp criticism from foreign monetary authorities who argue that a stronger dollar forces them to choose between two unpleasant alternatives: follow domestic policies that result in historically high interest rates or accept depreciation of their currencies.

Within the standard conceptual framework of exchange rate determination, movements of exchange rates, in the short run, are caused primarily by changes in interest-rate differentials.<sup>2</sup> Specifically, an increase in U.S. interest rates relative to those abroad should result in an increase in the foreign currency value of the dollar, other things equal. As the above criticisms demonstrate, however, exchange rate movements also may play an important role in influencing monetary

policy actions in some countries, which will be reflected in turn by changes in their short-term domestic interest rates. That is, a foreign monetary authority's response to changes in the exchange value of its currency may be to pursue a policy that affects the levels of its domestic interest rates. Consequently, when observing movements of both the exchange rate and the interest-rate differential, it is not immediately clear whether a change in the differential causes the exchange rate to change or whether the interest rate change is a monetary policy response to the exchange rate movement.

This element of uncertainty has been especially prevalent for the first three quarters of 1981. Chart 1 presents the trade-weighted foreign currency value of the dollar and the difference between the U.S. three-month CD rate and the trade-weighted foreign interest rate. While these two series exhibit the expected positive relationship before the first quarter of 1981 and after the third quarter of 1981, they display no statistically significant relationship during the first three quarters of 1981.<sup>3</sup>

On the other hand, chart 2 contains the trade-weighted foreign currency value of the dollar and the trade-weighted *foreign* interest rate. The relationship between these two series shows a much different pattern than that between the dollar and the interest-rate differential. While demonstrating only a weak positive relationship before 1981, the trade-weighted value of the dollar and the trade-weighted foreign interest rate

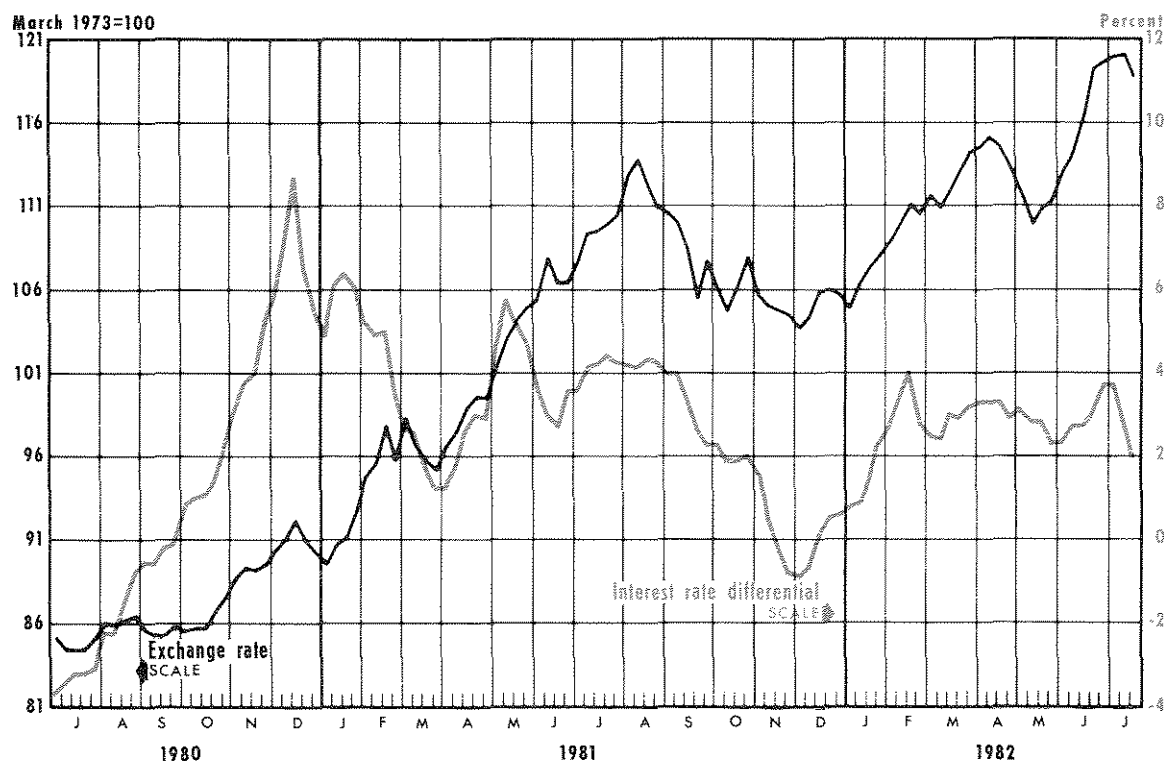
<sup>1</sup>The trade-weighted exchange rate is an average of the value of the dollar against 10 other currencies weighted by each country's trade share. The countries included are Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland and the United Kingdom. For a more detailed explanation, see "Index of the Weighted-Average Exchange Value of the U.S. Dollar: Revision," *Federal Reserve Bulletin* (August 1978), p. 700. The trade-weighted *foreign* interest rate presented below is a weighted average of short-term market interest rates for the same countries using the same weights.

<sup>2</sup>To be technically correct, short-run exchange rate movements are motivated by differences in real interest rates, i.e., market interest rates adjusted for expected inflation. For a more thorough discussion, see Dallas S. Batten, "Foreign Exchange Markets: The Dollar in 1980," this *Review* (April 1981), pp. 22-30. Consequently, changes in market interest-rate differentials and movements of exchange rates should be positively related *only if* the changes in market interest-rate differentials reflect changes in *real* interest-rate differentials.

<sup>3</sup>The calculated correlation coefficients between the trade-weighted dollar exchange rate and the interest-rate differential reported weekly for the approximate periods, I/1980-IV/1980, I/1981-III/1981 and IV/1981-II/1982, are .795, .158 and .828, respectively. The corresponding critical values at the 5 percent level are .266, .320 and .339, respectively.

Chart 1

# Foreign Exchange Value of the Dollar and U.S.-Foreign Interest Rate Differential



Source: Board of Governors of the Federal Reserve System

follow extremely similar paths during the first three quarters of 1981. Beginning in the last quarter of 1981, however, their paths diverge radically, with the trade-weighted foreign interest rate in April 1982 falling to its July 1980 level, while the dollar continues to rise in general.<sup>4</sup> Foreign monetary authorities apparently have been relatively more responsive to exchange rate movements (especially of the dollar) during most of 1981 than previously. Moreover, it also appears that foreign monetary authorities recently have changed their response to an increasingly strong dollar.

The purpose of this article is to examine this recent experience using an analytical framework that describes and evaluates the policy alternatives available to a foreign monetary authority whose currency is depreciating. Of particular importance are the relationship between external and internal policy objec-

tives, the role played by exchange rate movements in the formation of domestic monetary policy and the consequences of the policy choice.

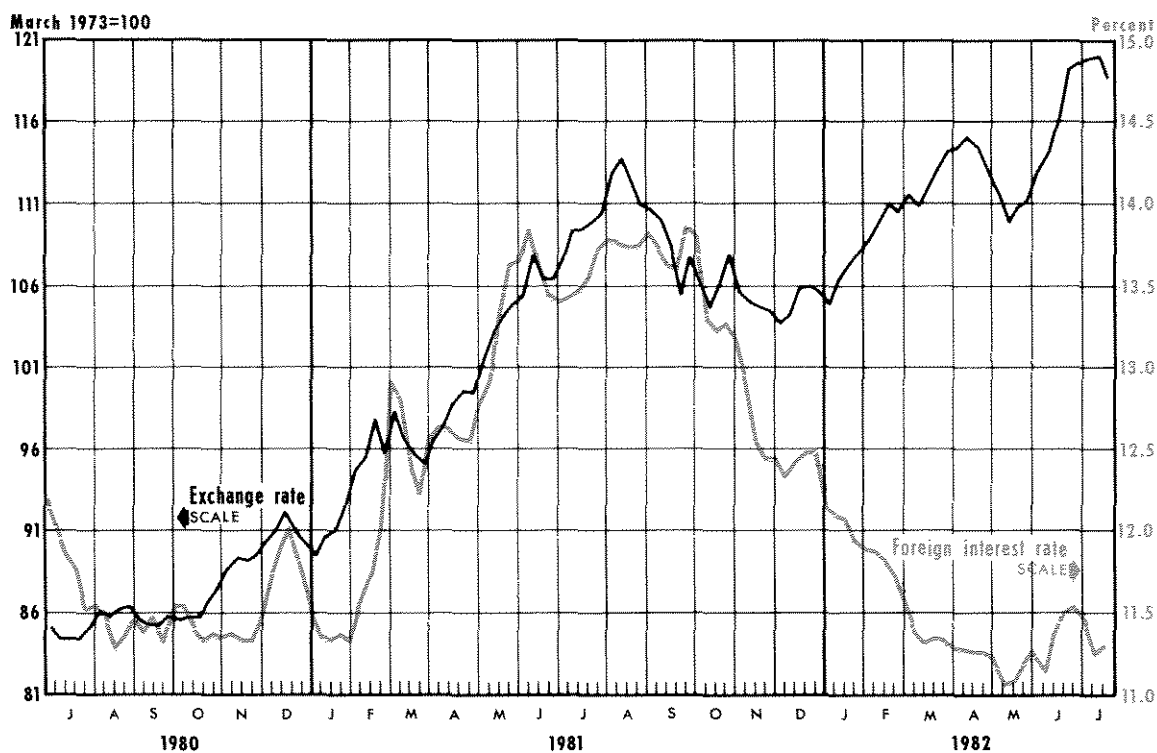
## POLICY ALTERNATIVES

Since the difference between U.S. and foreign short-term interest rates is a primary determinant of short-run exchange rate movements, a monetary authority has essentially three policy choices when domestic interest rates (adjusted for relative inflation rates) are below those of another country. First, it can do nothing and allow its exchange rate to depreciate sufficiently to compensate for the interest differential. In this case the economy will incur increased domestic unemployment in the short run as domestic resources are reallocated from the production of non-tradable goods to the production of tradable goods in response to changing relative prices. If the exchange rate movement is expected to be only temporary, however, this reallocation may be undesirable since relative prices are expected to return to previous levels. Furthermore, it is possible that domestic prices

<sup>4</sup>The calculated correlation coefficients between the trade-weighted dollar exchange rate and the trade-weighted foreign interest rate for the periods listed in footnote 3 are .379, .899 and -.789, respectively. The critical values are the same as those in footnote 3.

Chart 2

## Foreign Exchange Value of the Dollar and the Foreign Interest Rate



Source: Board of Governors of the Federal Reserve System

may rise with the prices of imports as domestic demand shifts to import-competing products.<sup>5</sup>

Second, it can adopt a tighter monetary policy to raise short-term domestic interest rates, thereby reducing the interest-rate differential and mitigating the downward pressure on its exchange rate.<sup>6</sup> If this tighter stance conflicts with the country's domestic objectives, the short-run costs of this choice are increased domestic unemployment and lower real output growth.

Third, a monetary authority can intervene in foreign currency markets by purchasing its own currency with its reserves of foreign currency. This would increase the demand for domestic currency relative to foreign currency and produce, at least temporarily, a reduc-

tion in the downward pressure on its exchange rate. It is not immediately clear whether the intervention will affect the exchange rate permanently. Consequently, an investigation of the conditions under which intervention will permanently affect the long-run path of exchange rate movements is crucial in determining whether intervention can be effective in counteracting the impact of unfavorable interest-rate differentials on the exchange rate.<sup>7</sup>

In analyzing the permanent nature of the impact of central bank intervention on the exchange rate, one must distinguish sales or purchases of foreign currencies that affect the size of the domestic money supply

<sup>5</sup>See R. I. McKinnon, "Optimum Currency Areas," *American Economic Review* (September 1963), pp. 717-24.

<sup>6</sup>The monetary authorities of most of the industrial countries other than the United States employ interest rate targeting as a means of controlling their money supplies. Consequently, a desire to lower the rate of money growth will lead to an increase in market interest rates (at least in the short run). Casual observation of the relationship between short-term market interest rates and the rate of money growth in these countries supports this conclusion.

<sup>7</sup>Intervention policy may not be necessarily aimed at permanently affecting the exchange rate. Instead, its focus may be simply to smooth short-run exchange rate fluctuations without having any impact on the long-run path of exchange rate movements. In this latter case, intervention that only temporarily affects exchange rates is sufficient to accomplish this objective. See, for example, Michael Mussa, "The Role of Official Intervention," Occasional Paper No. 6 (Group of Thirty, 1981). The purpose of this article, however, is to analyze policy alternatives designed to counteract the impact of unfavorable interest rate differentials. Consequently, the presumed goal of smoothing short-run exchange rate fluctuations is ignored here.

from those that do not.<sup>8</sup> Specifically, intervention is said to be "sterilized" if its impact on the domestic money supply is offset by the sale or purchase of domestic assets by the central bank. Intervention is said to be "unsterilized" if its effect on the level of commercial bank reserves and, consequently, the domestic money supply is not offset (see box).

### *Unsterilized Intervention and Exchange Rate Movements*

Suppose, for example, that the Fed attempts to prevent the dollar from depreciating by purchasing dollars with Deutsche marks (DM). If this intervention is unsterilized, it can affect the exchange rate in at least three ways. First, because the Fed's purchase of dollars temporarily increases the flow demand for dollars relative to the supply of dollars, the immediate effect should be an appreciation of the dollar (or a depreciation of the Deutsche mark).<sup>9</sup> This result, however, will be only transitory unless the Fed continues to purchase dollars day after day, thereby maintaining the higher flow demand for dollars.<sup>10</sup>

Second, since this transaction is unsterilized, it causes the U.S. money supply to fall and the German money supply to rise. All other things equal, there will be an excess demand for U.S. money in the United States and an excess supply of German money in West Germany — a stock disequilibrium that can be rectified only if aggregate spending falls in the United States and rises in Germany. This decline in U.S. spending and rise in German spending will cause the general price level in the U.S. to fall and that in Ger-

many to rise and, at the same time, motivate a permanent appreciation of the dollar.<sup>11</sup>

Finally, market participants may interpret the decrease in the U.S. money stock as an indication of further tightening of monetary policy by the Fed in the future. Since an exchange rate is the relative price of two specific financial assets (the two domestic monies involved), it is crucially influenced by expectations about the course of future events. Consequently, expectations of a tighter U.S. monetary policy in the future should place additional upward pressure on the current DM/dollar exchange rate as market participants anticipate the lower U.S. and higher German price levels described above.<sup>12</sup>

### *Sterilized Intervention and Exchange Rate Movements*

The immediate impact of sterilized intervention is the same as that for unsterilized intervention; that is, it creates a transitory increase in the flow demand for dollars, causing a temporary appreciation of the DM/dollar exchange rate. The net effect of sterilized intervention, however, is simply a purchase of domestic securities with foreign securities. Consequently, neither country's money supply will be affected; instead, private portfolios will contain fewer dollar-denominated and more DM-denominated securities.

Inasmuch as sterilized intervention affects neither the monetary factors that influence the long-run behavior of prices nor the real factors that determine the relative competitiveness of the economies, it is unclear initially what lasting impact it has on the DM/dollar exchange rate. It can have a permanent impact on the exchange rate if the public views domestic and foreign securities as being imperfect substitutes for each other.<sup>13</sup> Because these securities are denominated in different currencies, it is argued, the impact of exchange-rate movements and the possibility of ex-

<sup>8</sup>For convenience, it is assumed that all intervention operations are performed by the central bank. See A. B. Balbach, "The Mechanics of Intervention in Exchange Markets," this *Review* (February 1978), pp. 2-7, for a discussion of various other types of intervention operations.

<sup>9</sup>If the purpose of the intervention activity is to "lean against the wind," its impact may be insufficient to offset completely the effect of changes in fundamental determinants of the movement of the exchange rate. Consequently, intervention activity may not completely reverse the direction of exchange rate movements, but only slow the rate of change.

<sup>10</sup>All other things equal, if the increased flow demand is not maintained, demand and supply conditions in foreign currency markets will return to what they were prior to the Fed's intervention activity. Hence, this impact would only be temporary. See Michael Mussa, "Empirical Regularities in the Behavior of Exchange Rates and Theories of the Foreign Exchange Market," in Karl Brunner and Allan H. Meltzer, eds., *Policies for Employment, Prices, and Exchange Rates*, Carnegie-Rochester Conference Series on Public Policy, supplement to the *Journal of Monetary Economics*, Volume 11 (1979), pp. 9-57, especially pp. 27-38.

<sup>11</sup>See, for example, Batten, "Foreign Exchange Markets."

<sup>12</sup>See Jacob A. Frenkel, "Flexible Exchange Rates, Prices, and the Role of 'News': Lessons from the 1970s," *Journal of Political Economy* (August 1981), pp. 665-705.

<sup>13</sup>See Dale W. Henderson, "Modeling the Interdependence of National Money and Capital Markets," *American Economic Review* (February 1977), pp. 190-99; Lance Gorton and Dale Henderson, "Central Banks Operations in Foreign and Domestic Assets Under Fixed and Flexible Exchange Rates," in Peter B. Clark, Dennis E. Logue, and Richard J. Sweeney, eds., *The Effects of Exchange Rate Adjustments* (Government Printing Office, 1976), pp. 151-79; Peter Isard, *Exchange-Rate Determination: A Survey of Popular Views and Recent Models*, Princeton Studies in International Finance No. 42 (Princeton University Press, 1978).

## The Mechanics of Foreign Exchange Market Intervention

Suppose that the Federal Reserve purchases dollars (in other words, sells foreign currency — most often Deutsche marks) in foreign exchange markets in an attempt to prevent (or slow) the dollar from depreciating.<sup>1</sup> To do this, the Fed must have some Deutsche marks, which it typically acquires either by selling some of its non-negotiable DM-denominated securities to the Bundesbank or by borrowing DM from the Bundesbank in exchange for a DM-denominated account. Since both of these transactions are between central banks only, they have *no* impact on the size of either country's money stock.

The Fed then buys dollar-denominated demand deposits of foreign commercial banks held at U.S. commercial banks and pays for them from its DM deposits at the Bundesbank. This produces an increase in foreign commercial banks' reserve accounts at the Bundesbank and a decrease in their demand deposits held at U.S. commercial banks. On the other hand, for U.S. commercial banks, both their reserve accounts at the Fed and their demand deposit liabilities to foreign commercial banks have declined. Since U.S. commercial banks' reserves have fallen while German commercial banks' reserves have risen, the U.S. money stock will decrease and West Germany's money supply will increase as a result of this foreign exchange market operation.

As this example of unsterilized intervention shows,

<sup>1</sup>Although the Federal Reserve is portrayed here as the initiator of exchange market intervention, the analysis would not differ significantly in the case of intervention by foreign authorities.

change or capital controls adds an element of risk to the holding of foreign assets that cannot be totally eliminated with a diversified portfolio.<sup>14</sup>

If dollar-denominated and DM-denominated securities were perfect substitutes, no change in the exchange rate or in interest rates would be required to motivate investors to hold the new portfolio that contains fewer dollar-denominated and more DM-denominated securities. If, however, these securities are *not* perfect substitutes, investors will be unwilling to hold the new portfolio and, at the original exchange rate and interest rates, an excess demand for dollar-

denominated securities (and an excess supply of DM-denominated securities) will exist. Consequently, investors will attempt to acquire additional dollar-denominated securities and sell DM-denominated securities in order to return their portfolios to the desired proportion of dollar-denominated to DM-denominated securities, placing upward pressure on the DM value of the dollar.<sup>15</sup> In other words, even though the two domestic money supplies have been unaffected by the intervention activity, the resulting portfolio disequilibrium (caused by foreign and domestic securities being imperfect substitutes) has a permanent impact on the exchange rate.

In a similar fashion, the Bundesbank could neutralize the impact of the U.S. intervention on the German money supply by draining the newly created reserves from the West German commercial banking system.<sup>2</sup> If completely sterilized, the foreign exchange operation affects neither country's money supply. Private portfolios contain fewer dollar-denominated securities and more DM-denominated securities, while the Fed's portfolio contains more dollar-denominated and fewer DM-denominated securities.

<sup>2</sup>The institutional arrangements for accomplishing this may differ across the countries; the exact means used are not important here. Moreover, if the Fed acquired DM (used to purchase dollars) by selling DM-denominated securities in private capital markets, the German money supply would not be affected by the intervention activity, and the Bundesbank would not have to sterilize the operation.

<sup>14</sup>See Girton and Henderson, "Central Bank Operations," pp. 152-53.

<sup>15</sup>The realignment of portfolios will, at the same time, place upward pressure on German interest rates and downward pressure on U.S. interest rates.

Since the efficacy of sterilized intervention hinges on the imperfect substitutability of foreign and domestic securities, the degree of substitutability that actually exists is crucial. Empirical tests of the existence of this risk have yielded mixed results.<sup>16</sup> Thus, whether sterilized intervention has a significant lasting impact on exchange rates remains uncertain.

### *Intervention and Monetary Policy*

It seems that if the monetary authority wants to influence permanently the path of its exchange rate, and not merely dampen short-run fluctuations, it must engage in unsterilized intervention. It is clear, however, that unsterilized intervention is tantamount to conducting monetary policy through foreign exchange market operations. Hence, in this case, intervention is not really an alternative to monetary policy but merely a variant of it. Only sterilized intervention is a distinct policy alternative.

Since there can be only a single monetary policy stance, the role of unsterilized intervention depends critically on the importance that policymakers place on the exchange rate in relation to other economic variables, as a factor influencing the conduct of monetary policy. In particular, the use of unsterilized intervention (with the concomitant impact on the domestic money supply) implies that the monetary authority places relatively more importance on reducing the risks and the real economic disturbances associated with exchange rate movements than on influencing domestic prices, output and employment.

Since the exchange rate is the relative price of two domestic monies, it is affected, among other things, by changes in the demand for foreign money, actual and expected policy changes of foreign monetary authorities, and whatever changes emanate from within the

domestic economy itself. Directing domestic monetary policy at an exchange rate target, therefore, subjects the economy to both domestic and foreign influences. Consequently, the monetary authority loses its ability to control its own money supply independently of foreign actions and events.<sup>17</sup>

The desire to influence the movement of exchange rates without losing control of the money supply is the primary rationale for using sterilized intervention. As discussed above, however, it is not clear that sterilized intervention has a significant lasting impact on exchange rates. Sterilized intervention may be an appropriate policy to reduce unwanted short-run variability of exchange rates for which there may be no readily identifiable cause. When monetary authorities desire to alter the path of exchange rate movements, however, sterilized intervention may be inadequate. Consequently, monetary policymakers must choose between internal and external objectives.<sup>18</sup>

### RECENT EXPERIENCE

Monetary authorities seldom choose the first policy alternative discussed above; they don't appear to like to "do nothing" about the problems that they face. Studies of central banks' demand for and use of foreign currencies, as well as reports from central banks themselves, indicate that large-scale intervention in foreign currency markets has continued since the movement to floating exchange rates in 1973.<sup>19</sup> If central bankers desire to influence exchange rates, the policy choice narrows down to sterilized or unsterilized intervention. Although policymakers might prefer sterilized intervention, since it appears to allow them to separate

<sup>16</sup>Jeffrey A. Frankel, "A Test of the Existence of the Risk Premium in the Foreign Exchange Market vs. the Hypothesis of Perfect Substitutability," International Finance Discussion Paper No. 149 (Board of Governors of the Federal Reserve System, August 1979) finds no support at all for the existence of a risk premium. Alternatively, Richard Meese and Kenneth J. Singleton, "Rational Expectations, Risk Premia, and the Market for Spot and Forward Exchange," International Finance Discussion Paper No. 165 (Board of Governors of the Federal Reserve System, July 1980) concludes that the failure of the forward exchange rate to be an unbiased predictor of the future spot rate is a consequence of the existence of a risk premium. Finally, Maurice Obstfeld, "Can We Sterilize? Theory and Evidence," NBER Working Paper No. 833 (January 1982) finds evidence of imperfect asset substitutability, but questions the ability of central banks to exploit it. That is, imperfect asset substitutability appears to be a necessary, but may not be a sufficient, condition for sterilized intervention to have a significant impact on the exchange rate.

<sup>17</sup>The extreme case is the one in which the monetary authority desires to maintain a completely fixed exchange rate. In this case, the monetary authority has no ability at all to influence the size of its domestic money supply. See Herbert G. Grubel, *International Economies* (Richard D. Irwin, Inc., 1977), pp. 375-80.

<sup>18</sup>For an example of a monetary authority's recognition of this dilemma, see *Monthly Report of the Deutsche Bundesbank* (February 1981), p. 7.

<sup>19</sup>See, for example, Dallas S. Batten, "Central Banks' Demand for Foreign Reserves Under Fixed and Floating Exchange Rates," this *Review* (March 1982), pp. 20-30; Jacob Frenkel, "The Demand for International Reserves Under Pegged and Flexible Exchange Rate Regimes and Aspects of the Managed Float," in David Bigman and Teizo Taya, eds. *The Functioning of Floating Exchange Rates* (Ballinger, 1980), pp. 161-95; H. Robert Heller and Mohsin S. Kahn, "The Demand for International Reserves Under Fixed and Floating Exchange Rates," *IMF Staff Papers* (December 1978), pp. 623-49; and John Williamson, "Exchange Rate Flexibility and Reserve Use," *Scandinavian Journal of Economics* (No. 2, 1976), pp. 327-39.



**Table 1**  
**Quarterly Money Growth for Selected Countries**  
**(compounded annual rates, seasonally adjusted)**

Country	III/80	IV/80	I/81	II/81	III/81	IV/81	I/82
Canada	13.2%	16.3%	1.1%	4.7%	-3.8%	-16.0%	14.8%
France	8.3	10.2	11.3	13.2	18.8	18.8	N.A.
Germany	4.5	9.5	-1.6	-4.8	-1.6	0.5	5.6
Italy	11.8	16.2	16.8	4.5	3.0	10.1	15.5
Japan	-6.1	-3.5	2.6	21.0	3.3	11.0	8.7
Netherlands	6.7	10.2	4.9	-5.3	-4.9	5.7	13.5
Switzerland	5.5	4.8	-10.4	2.8	-5.1	14.7	41.5
United Kingdom	-2.0	13.1	15.8	14.5	5.1	1.4	10.1

SOURCE: Federal Reserve Bank of St. Louis, *International Economic Conditions*.

exchange rate policy from domestic monetary policy, they have come to realize that sterilized intervention will not suffice, at least in some situations. The last year and a half provides a good example of the trade-off inherent in the choice of intervention policy.

From the middle to the end of 1980, the foreign currency value of the dollar rose along with U.S.-foreign short-term interest differentials. During this period (actually, since about November 1978), the U.S. monetary authority had intervened frequently and on a consistently large scale in foreign currency markets; it primarily "leaned against the wind," that is, bought dollars when the dollar was depreciating and sold dollars when it was appreciating.

With the advent of the Reagan administration, the Treasury announced that it (along with the Federal Reserve) would cease daily intervention except for periods of substantial exchange market volatility. This removed an extremely large and cooperative participant from foreign currency markets. Consequently, foreign monetary authorities who desired to remain active in foreign currency markets were faced with two policy options if they wished to have the same impact on exchange rates as before: either increase the amount of their intervention (if they wished to continue to sterilize it) or sterilize less of their existing intervention.

The magnitude of foreign central bank intervention activity has not changed significantly since the change in U.S. intervention policy. There is evidence, however, of more unsterilized intervention since this change. Table 1 contains the quarterly rates of M1 growth for several major industrial countries that are important trading partners of the United States. Except in France and Japan, M1 growth in each country displays a sig-

nificant slowing during 1981.<sup>20</sup> The abruptness of this change can be seen more clearly in table 2, which reports three-month money growth rates for five of these countries. Not surprisingly, foreign short-term market interest rates also began to rise rather dramatically in early 1981. In fact, as shown in chart 2, market interest rates of the major trading partners of the United States generally moved with the trade-weighted exchange rate during the first three quarters of 1981, apparently because foreign monetary authorities were tightening their monetary policies in attempts to mitigate the rise of the U.S. dollar.<sup>21</sup>

<sup>20</sup>Even though Canada is the only country considered that explicitly targets on the M1 definition of money, this definition is employed because it has been found to be an appropriate indicator of monetary policy. See Dallas S. Batten, "Money Growth Stability and Inflation: An International Comparison," this *Review* (October 1981), pp. 7-12; and Dallas S. Batten and R. W. Hafer, "Short-Run Money Growth Fluctuations and Real Economic Activity: Some Implications for Monetary Targeting," this *Review* (May 1981), pp. 15-20. For France, however, M1 growth may be a poor indicator of the stance of monetary policy after Mitterand took office in mid-1981. The new administration imposed severe interest rate ceilings on savings and time deposits, which motivated relatively large flows from accounts *not* included in M1 to accounts included in M1. The net result was extremely rapid M1 growth.

<sup>21</sup>The relationship between the trade-weighted value of the U.S. dollar and the trade-weighted *foreign* interest rates (shown in chart 2) is much closer in the first three quarters of 1981 than in any interval since the beginning of the United States' pro-intervention stance. Obviously, all monetary policy actions taken by these countries do not necessarily reflect the desire to achieve exchange rate objectives. For example, Germany has experienced a large current account deficit and Canada and Switzerland have each encountered accelerating domestic inflation. The magnitude of the change in money growth at the beginning of 1981 and the fact that the timing of the response so closely paralleled the change in U.S. policy, however, certainly provide a casual verification that exchange rate objectives have played an important role.

**Table 2**  
**Three-Month Money Growth for Selected Countries**  
**(compounded annual rates, seasonally adjusted)**

Date	Canada	Germany	Italy	Netherlands	Switzerland
1980 October	18.3%	9.6%	10.2%	11.9%	7.4%
November	22.2	16.6	13.4	8.2	4.7
December	8.9	2.5	24.5	10.4	2.4
1981 January	1.9	7.0	20.7	9.9	-6.3
February	-4.3	-3.8	17.7	6.5	-7.7
March	6.2	-7.1	11.7	-1.7	-16.8
April	11.1	-11.5	5.7	-2.8	1.6
May	8.2	-8.2	3.7	-4.8	2.7
June	-4.6	6.0	6.5	-8.2	4.1
July	6.7	2.9	5.2	-10.7	-2.9
August	-7.0	3.4	2.2	-5.0	-5.7
September	-10.6	-6.6	0.9	1.4	-6.8
October	-28.7	-4.1	3.8	8.8	-17.1
November	-19.8	0.8	6.6	9.8	-14.0
December	22.7	5.1	21.9	-1.1	99.6
1982 January	32.6	9.9	24.7	8.6	88.2
February	28.9	2.2	21.4	2.9	94.0
March	-0.5	4.9	2.1	28.7	-17.7

SOURCES: *Bank of Canada Review*; *Monthly Report of the Deutsche Bundesbank*; Board of Governors of the Federal Reserve System; and International Monetary Fund, *International Financial Statistics*. Germany and Italy seasonally adjusted by this Bank.

These policy decisions to limit the rise in the exchange value of the dollar, however, were not cost-free, as charts 3 and 4 show. Continued economic stagnation was the price paid for redirecting monetary policy. Except for Japan, all countries experienced rising unemployment and little or no real economic growth during the first three quarters of 1981.

In light of the economic conditions at the time, it is not too surprising that foreign central banks responded differently to a rising U.S. dollar at the end of 1981 and the beginning of 1982 than they did at the beginning of 1981. In particular, the re-emergence of a strong dollar at the end of 1981 did not elicit a tighter monetary policy stance and the subsequent higher short-term interest rates that had occurred at the beginning of the year.<sup>22</sup> Since, in general, these countries have continued to experience economic stagnation, it appears

that central banks were unwilling to exacerbate the situation by subjecting their economies to even tighter monetary conditions necessary to raise domestic interest rates further and moderate the rise of the dollar. In fact, foreign short-term interest rates fell considerably during the last quarter of 1981 and the first quarter of 1982. Thus, foreign central banks now seem willing to allow the foreign exchange value of their currencies to depreciate instead.

## SUMMARY AND CONCLUSIONS

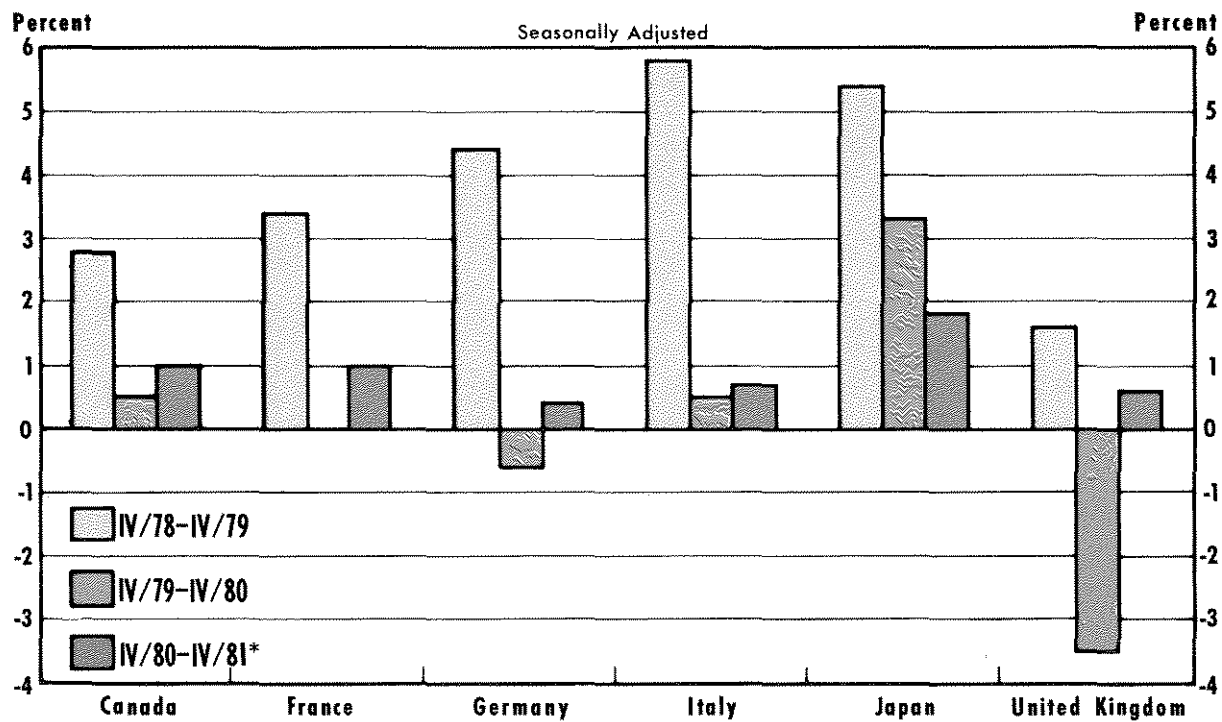
This article has attempted to describe, using a simple analytical framework, both the policy alternatives available to a central bank and their consequences. During the floating exchange rate period, central banks consistently have intervened in foreign currency markets. Because unsterilized intervention diminishes a central bank's ability to control its domestic money stock, it generally has opted to separate external and internal policy objectives by sterilizing the impact of intervention on its money stock. Sterilization, however, decreases the efficacy of intervention. Consequently, foreign central banks welcomed the U.S.' pro-

<sup>22</sup>The increase in the rates of money growth abroad at the beginning of the fourth quarter of 1981 most likely contributed to the subsequent rise in the foreign currency value of the dollar. The point made, however, is that once a relatively strong dollar re-emerged, foreign monetary authorities did not appear to respond in the same manner as they had at the beginning of 1981.



Chart 3

## Growth of Real Output

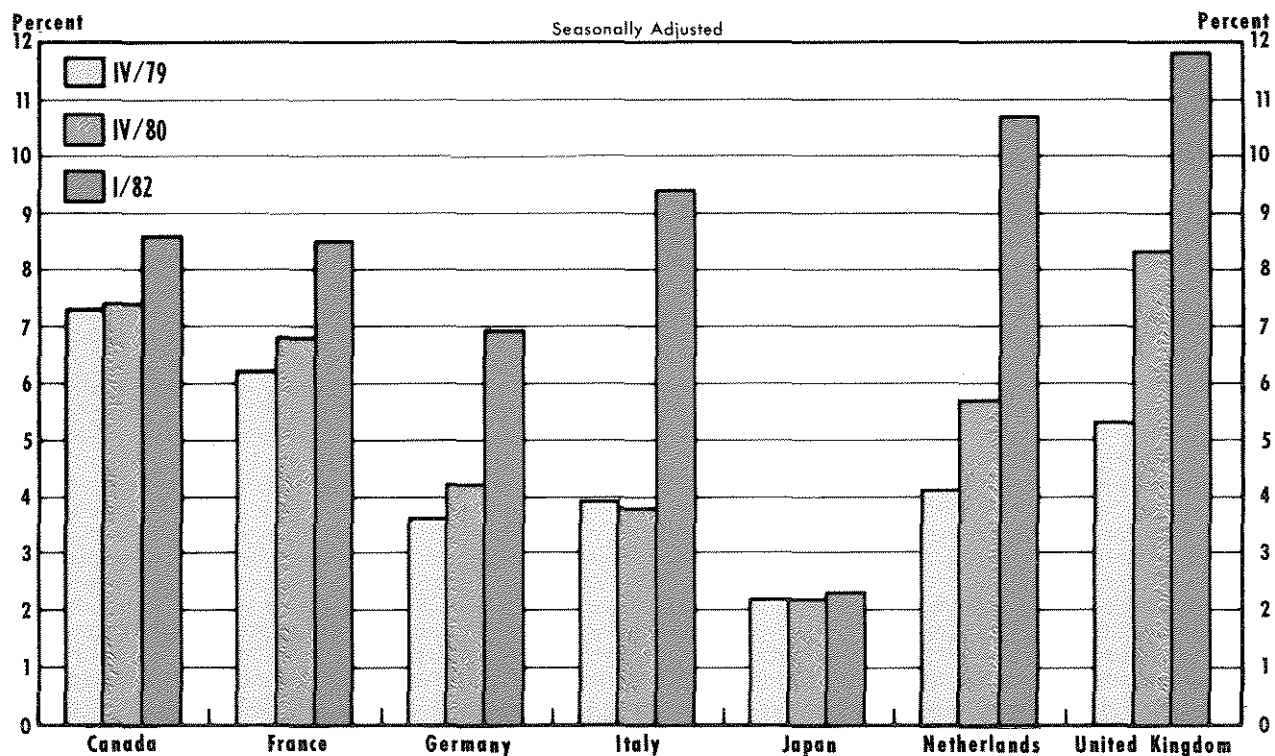


Source: Federal Reserve Bank of St. Louis, *International Economic Conditions*.

\*For France, the data available is for III/81.

Chart 4

## Unemployment Rate



Source: U.S. Department of Commerce, *International Economic Indicators*.

intervention stance initiated in late 1978 and were disappointed with the Reagan administration's decision to abandon this position in February 1981.

The evidence presented in this article suggests that the February 1981 policy change has forced foreign central banks that wish to influence exchange rate movements to alter their domestic monetary growth rates. In particular, since the exchange value of the U.S. dollar generally has been rising during the past

two years, foreign central banks have had to choose between allowing their currencies to depreciate and changing their monetary growth rates drastically. They chose the latter in early 1981. Money growth slowed dramatically, resulting in continued domestic economic stagnation in many of the countries examined. Since the end of 1981, they have opted for the former policy choice and, as a result, the foreign exchange value of the dollar has increased substantially while money growth in the various countries has eased.

